



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
-----------------	-------------	----------------------	---------------------	------------------

10/824,225

04/14/2004

Dieter Ritter

P04,0101

6358

7590

11/20/2006

SCHIFF HARDIN LLP

Patent Department

6600 Sears Tower

233 South Wacker Drive

Chicago, IL 60606

EXAMINER

ARTMAN, THOMAS R

ART UNIT

PAPER NUMBER

2882

DATE MAILED: 11/20/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/824,225

Applicant(s)

RITTER, DIETER

Examiner

Thomas R. Artman

Art Unit

2882

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 11 September 2006.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-12 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-12 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 19 August 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

DETAILED ACTION

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1-5 and 7-11 are rejected under 35 U.S.C. 102(b) as being anticipated by Alexandrescu (US 6,272,368 B1).

Regarding claims 1 and 7, Alexandrescu discloses an X-ray apparatus and method of use, including:

a) disposing an examination subject 6 disposed between an x-ray source 3 and a radiation detector 2 in an x-ray imaging system (Fig. 5), where the source and detector are mounted upon a carrier support 1,

b) moving the carrier support relative to the examination subject for acquiring a series of 2D projections of the examination subject with the source and detector, and

c) performing a distance measurement via active triangulation (col.3, lines 21-24) with an optical 3D sensor 11 mounted to the carrier support 1 while moving the carrier support relative to the examination subject to acquire a 3D image dataset with the 3D sensor, conforming to at least a portion of the surface of the examination subject (col.3, lines 9-35 and lines 54-61).

Art Unit: 2882

With respect to claims 2-5 and 8-11, Alexandrescu further discloses that the carrier support is a C-arm that is isocentrically arranged, where the supporting arrangement moves in both circumferencial and angular movements to acquire 2D projections of the patient (col.2, lines 44-61).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Navab in view of Carol (US 5,622,187).

Regarding claims 1 and 7, Navab discloses an apparatus and method (Figs.2, 9 and 10), including:

a) an X-ray imaging system having a carrier support (C-arm) with an X-ray source and a radiation detector allowing an examination subject to be disposed between the X-ray source and the radiation detector,

b) a supporting arrangement (Fig.2) for the carrier support for moving the support relative to the examination subject for acquiring a series of 2D projections of the examination subject with the X-ray source and the radiation detector,

c) an optical 3D sensor 22 mounted to the carrier support, and

d) the supporting arrangement for the carrier support also moves the support relative to the examination subject for acquiring a 3D image dataset with the optical 3D sensor representing at least a portion of a surface of an object (optical phantom, see at least Fig.9).

Navab does not specifically disclose that the optical 3D image dataset is that of the examination subject. The image data set is of a phantom placed in a known spatial relationship with the examination subject.

Carol specifically teaches the practice of taking images of a subject 50 with an optical 3D sensor 100 that acquires a 3D image dataset, representing a height above a 2D plane, conforming to at least a portion of a surface of the subject (Fig.1). Carol images the examination subject directly proper positioning of the system. Carol images the examination subject directly for greater accuracy and precision, rather than relying upon additional, separate structures, such as the phantom of Navab, where additional errors can result due to imperfect positioning and measurement of that position relative to the examination subject.

It would have been obvious to one of ordinary skill in the art at the time the invention was made for the 3D image datasets of Navab to conform to at least a portion of the surface of the subject, rather than the surface of a separate phantom, in order to improve the accuracy and precision of positioning and image superimposition, as shown by Carol.

Further regarding claims 1 and 7, Navab does not specifically disclose the use of any of the claimed distance measurements.

Carol specifically teaches the practice of calculating distance with the optical 3D dataset by triangulation or other 3D calculation methods known in the art (col.8, line 61 through col.9,

Art Unit: 2882

line 17) in order to provide accurate 3D data of the location of the patient with respect to the x-ray device (col.9, lines 26-50).

It would have been obvious to one of ordinary skill in the art at the time the invention was made for Navab to use triangulation as a known distance calculation algorithm for accurate 3D patient positioning as taught by Carol.

With respect to claims 2 and 8, Navab further discloses that the carrier support is a C-arm (Fig.2).

With respect to claims 3 and 9, Navab further discloses that the C-arm has a circumference, where the supporting arrangement moves the C-arm along the circumference during acquisition of the series of 2D projections (Figs.8 and 10).

With respect to claims 4 and 10, Navab further discloses that the supporting arrangement moves the C-arm through an angulation movement for acquiring the series of 2D projections (Figs.8 and 10).

With respect to claims 5 and 11, Navab further discloses that the C-arm and the supporting arrangement form an isocentric apparatus (see Figs.8 and 10).

With respect to claims 6 and 12, the Navab/Carol combination has a computer 20 supplied with the series of 2D projections calculates a volume dataset of the body of the

Art Unit: 2882

examination subject, and for combining the image dataset with the volume dataset by fusion (Fig.9 of Navab).

Response to Arguments

Applicant's arguments with respect to claims 1 and 7 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a).

Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Art Unit: 2882

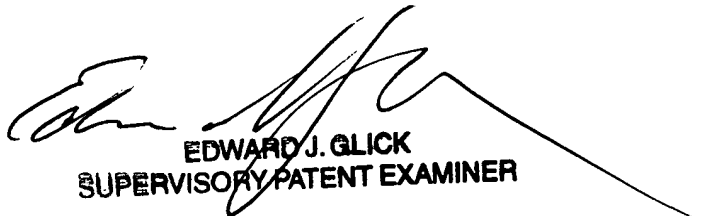
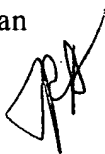
Any inquiry concerning this communication or earlier communications from the examiner should be directed to Thomas R. Artman whose telephone number is (571) 272-2485.

The examiner can normally be reached on 9am - 5:30pm Monday - Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ed Glick can be reached on (571) 272-2490. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Thomas R. Artman
Patent Examiner



EDWARD J. GLICK
SUPERVISORY PATENT EXAMINER